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Stilboestrol in Veterinary Practice*

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I am not proposing this afternoon to give a lecture on the actions and uses of stilboestrol dipropionate. My object is to describe my experiences and put forward my theories in the hope that this will encourage others to do the same and so produce an instructive discussion.

Stilboestrol is one of those drugs that attracted the interest of the veterinary and medical professions ever since its early trials and long before it was on the market. Amazing results have been claimed for its use, but the more careful members of both professions have waited until the true values of this new drug have been assessed.

A little clinical courage is, of course, a help to the research workers who, following on more theoretical lines, may have completely overlooked some action or use.

Personally, I began using this drug 18 months ago, and have continued to use it fairly consistently ever since. After 12 months I spoke with authority about it, when I undertook this paper I was still full of my own opinions, now I am full of doubts! It is plainly a wonderful drug and most useful to the practitioner in a variety of ways, but there is still a great deal to be learned. Doubtless, research workers know more than they have told us and clinicians have abstained from broadcasting their findings.

Stilboestrol may be administered by (1) intramuscular injection, (2) per os, (3) by intra-uterine injection, and (4) by subcutaneous implantation. The method of administration, or more particularly the dosage, has a profound effect on the results obtained. The main action of stilboestrol is on the sexual organs, primary and secondary. I will give a summary of these actions, but I hope Miss Weddell will enlarge on them further.

All doses produce visible signs of oestrus, but whereas small doses increase milk secretion, large doses tend to inhibit secretion. This is, of course, of considerable economic importance in dairy practice and should be borne in mind when treating any animal. It is now generally accepted that stilboestrol does not induce ovulation in the bovine or ovine in true anoestrus, though, in other species, whether or not ovulation occurs is a debatable point. There is also a marked reduction in tone of the pelvic ligaments which presumably explains the cases of fractured pelvis in the cow which have followed injections of stilboestrol. These actions can, of course, be utilised in a variety of ways; in the treatment of pyometra and metritis it is of undoubted value, mummified foetus and retained foetal membranes may be expelled in all animals, parturition may be induced in cases of delayed birth, and abortion may be produced. Some also recommend its use in cases of dystocia and the action on the mammary glands is utilised in a variety of ways. It has also been used in some cases of fits in dogs due to dysfunction of the sexual organs.

In my opinion it has definite possibilities in the treatment of pyometra in the bitch and deserves further trial, and, as my experience has been greater in this connection than in other fields, I will give a few details.

Over a period of twelve months 17 cases of pyometra were examined and of these 16 were treated with stilboestrol—the remaining case was very toxic and I considered that it had not sufficient resistance left to tide over the time that must elapse before the stilboestrol injection began to take effect. Of the 16 cases, eight bitches made complete recoveries and the majority of them have, to my knowledge, been in oestrus since and shown no sign of recurrence. Of the remaining eight, two bitches showed signs of recurrence at the following heat and four showed signs of recurrence after varying short intervals of two to six weeks. One in the first group and two in the second group made complete recoveries. The remaining three cases died within a few days of being presented. One was an aged and very fat spaniel, the second a grossly fat retriever with cystitis and the third was a young Collie with apparently no complications—unfortunately it was not possible to make a *post-mortem* examination of this case.

The procedure followed is to give an intramuscular injection of 1 to 3 mgs. stilboestrol and a course of a sulphonamide drug by the mouth. The bitch is then examined after 48 hours and if there is no sign of oestrus a further dose of stilboestrol is given. If oestrus is present an injection of hypophysin is given and this is repeated as required. Heat is usually present for about a week so that stilboestrol is given every five days to ensure a continuous flow from the uterus, and hypophysin is given at intervals of 24 to 48 hours to increase the rate of discharge. This is continued until the fluids from the uterus appear to be normal, then a further injection of stilboestrol is given to reduce the risk of any infection remaining. In those cases that recur after two to six weeks, I repeat the treatment and if they recur I recommend surgical interference. In a few cases in which operative treatment followed within 48 hours of an injection of stilboestrol, the peritoneal cavity was found to contain a quantity of fluid; whether or not this was the result of the injection or due to the natural sequence of the disease it was impossible to state. Several writers have reported collapse following treatment and attributed this to various causes—some suggest interference with the action of the heart, others that there is a sudden release of poison into the system, certainly during the few hours immediately prior to the onset of oestrus the bitch appears to be in pain. Again I hope for further information from Miss Weddell on this matter.

I have heard good reports of stilboestrol in whelping cases, but so far I have had no success myself, and as the full action is not usually evident for 24 to 36 hours it does not appear to be a very logical line of treatment in the more usual type of whelping case.

In cases of phantom pregnancy in bitches, tablets may be given by the mouth or minute tablets may be implanted subcutaneously. The dose for terriers by the mouth is 5 mgs. twice a day and by implantation one 5 mgm. tablet. This tablet is apparently completely absorbed during the following few months as there is no reduction in milk secretion following the next oestrus, nor is there any apparent increase which might result from small traces still being absorbed. Personally, I have not had great experience of this method, as the tablets by the mouth are in every way so much easier and just as satisfactory.

The use of stilboestrol as a "tonic" has been advocated, but presumably success in such cases is due to the correction of some undiagnosed dysfunction of the sexual secretions liberated in the bloodstream.

In cases of accidental mating large doses of 1 mg. per lb. body weight intramuscularly appear to prevent the embryo from becoming embedded and so pregnancy does not ensue. I have noticed in these cases that a return of oestrus may not be obvious for as long as a week after injection, but whether or not this is due to the size of the dose or to the circumstances I am unable to decide.

In the cow, stilboestrol is mainly employed in cases of pyometra, metritis, mummified foetus and retained placenta. Care must be taken not to exceed the necessary dose as this may result in a reduction in the milk yield. In a few cases stilboestrol implants have been used to induce lactation in dry cows.

The dose usually employed is 20 to 30 mgs. by intramuscular injection. This may be repeated in 24 to 48 hours if considered necessary. In cases of pyometra and metritis, the expression of the corpus luteum is also advisable and subsequent irrigation of the uterus should be carried out: the solution used for irrigation will, of course, depend upon the causal organism. The diseases of the bovine reproductive organs have become such a widely discussed subject that I shall only touch on it where stilboestrol may be of value.

In cases of retained placenta a great deal of unpleasant manual labour may be avoided by the intramuscular injection (15 to 20 mgs. stilboestrol) within 48 hours of calving; then by the third or fourth day the membranes may either have come away or be considerably easier to remove due to a loosening of the cotyledons and also the involution of the horns of the uterus. In the practice to which I belong, we have been so convinced of the benefit to the cow of stilboestrol injections in preference to removal with difficulty that, where necessary, two or three injections are given at intervals of 48 hours. When the placenta finally comes away the discharges are of a markedly improved character. This may be considered wishful thinking, but the action is logical and the results appear to justify the continued use of stilboestrol in this condition.

Dry cows can be brought to milk by implanting a 1 gramme tablet intramuscularly, but if the implant is made whilst the animal is lactating, she will go dry.

* Presented to the Society of Women Veterinary Surgeons, at York, July 17th, 1943.

Implants take a very variable time to act; sometimes lactation may begin after 14 days and gradually increase; in other cases, after four to six weeks milk will suddenly appear and within a few days the yield has risen to 20 lb. or more.

In goats and sheep the dose of stilboestrol is comparatively very much smaller, but the actions and uses appear similar—my personal experience has not been very great in either species.

Pigs respond readily to small doses of stilboestrol.

Cats may be treated in a similar manner to dogs, though I have no experience of a large dose following misalliance.

In summing up, I would suggest that of the recent discoveries in veterinary practice that of stilboestrol ranks only second in importance to that of the sulphonamide group. When more is known of its action on all the various organs of the body, we clinicians will feel able to use it with more certainty as to the result of our treatment, but meantime it is the duty of everyone to exchange all information obtained during its use whilst abstaining from vague rumours, good or bad.

Discussion

Miss Weddell opened the discussion by giving an account of the history of stilboestrol from the introduction in 1924 of the rat vaginal smear assay for estimating the activity of female sex hormones through the crystallisation of the natural oestrogenic hormones up to the chemical researches which culminated in the discovery by Dodds and his co-workers in 1938 of 4:4'-hydroxy diphenyl alpha-beta-diethyl stilbene. Stilboestrol is unusual in having no chemical relationship to the natural hormone it replaces. In pharmacological action, however, it appears to be practically identical to the natural oestrogen and has 2½ to three times the activity of oestrone by the rat vaginal smear test: it has a similar action on the uterus, vagina, mating reaction and nipple of laboratory animals and also was found to prevent implantation of the fertilised ovum and in large doses terminated established pregnancy in rabbits. Stilboestrol has the important attributes of retaining its activity when administered orally (it is commonly administered by this route), and of being a simple synthetic compound which is therefore easily obtainable and of relatively low cost. The view was expressed that the interesting observations that similar physiological activity could be shared by a number of chemical compounds whose relationship to one another was obscure would undoubtedly lead to still further research and chemotherapeutic developments.

Some Factors Influencing the Drinking Water Requirements of the Rabbit

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The assessment of the water requirement of a 2·5 kilo rabbit at 65 c.cm. per kilo daily on a dry diet (Kennaway) should help to emphasise the importance of ensuring an adequacy of moisture, in some form, for these animals. It is well known that animals can live longer without food than without water and Rubner observed that the body can lose nearly all its fat, and over half the protein, and continue to live, but the loss of 10 per cent. of its water causes death.

Water is essential for the animal's normal physiology. If deprived of it the food constituents are not dissolved to a form which enables digestion to take place nor can the waste products be eliminated from the body, and if it remains there too long the blood thickens, the temperature rises, and there is an aversion to food. Diarrhoea may occur before death ends the animal's misery.

The body's need for water varies at different stages of the life cycle, but during the early growth its tissues are mainly composed of water. In mature rabbits the flesh (muscle and fat) contains an average of 63·6 to 69·7 per cent. in males and 55·2 to 67·3 per cent. in females of comparable age reared under similar conditions (King Wilson and Morris, 1932; King Wilson and Botham, 1934); the lower percentage of moisture in females is apparently due to the differential fat metabolism. The lean animal contains more moisture per weight unit than the fat one. Bone contains approximately 50 per cent. water whilst the viscera are largely composed of it.

During lactation the water requirement rises sharply although rabbit's milk contains more dry matter—having 30·5 per cent.—than that of cows or goats, but a high-producing doe yields approximately 35 g. per kg. live weight. This output cannot be maintained if there is serious water, or dietary, deficiency. This milk is rich in protein, fat and minerals needed for the rapid growth rate of the young. If there is serious shortage of water, of quality and/or quantity of food, then the growth rate of the young is retarded (King Wilson and McCartney, 1940). Litters of one to three young grow faster than those of four to six or more, whilst larger numbers also seriously prejudice the chances of survival to maturity.

In pre-war days a good winter lactation ration for use in the absence of succulents comprised: hay 200 g., oats 200 g., bran 60 g. and raw milk 260 g. (60 g. whole, remainder skimmed). With this combination no water was necessary (Hagelin, 1935), but on semi-dry diets a giant doe with a litter of seven young, eight weeks old, will drink about 4,539 c.c. of water in 24 hours (Templeton, 1939).

Adequate nutrition necessitates an adequate supply of water and it plays an important role in mineral metabolism since inadequacy of NaCl causes loss of moisture from the body, leading to a decline in growth and health. The maximum daily salt consumption, without increasing thirst, was 0·3 g. (Gompel *et al.*, 1936), but large type males took 0·1 g. and females with litters 0·24 g. (Templeton, 1938).

The problem of whether rabbits *drink* is a separate problem from that of their need of water, since all their foodstuffs contain moisture, though in very variable amounts. A ration consisting of green food or roots would usually contain an excessive amount of moisture since these substances contain roughly 75 to 90 per cent. Potatoes contain 75 per cent., hay 14 and grains 11 per cent. of moisture. It has been found that a combination of hay and roots, or potatoes, provided adequate moisture so that practically no drinking occurred, but when only dry food (*e.g.*, grain and hay) was given, about 130 c.c. water were drunk (Brüggemann, 1937), whilst on oats or dry mash 80 to 100 c.c. (Christian, 1936) were drunk. There was considerable variation between individual rabbits, *e.g.*, 118 to 200 c.c., on the same foodstuff (hay). When 10 to 20 per cent. of the dry mash in a mixed ration was replaced by fresh spent tea leaves the water consumption fell from 147 to 94 c.c. daily (King Wilson, 1942); the substitution of spent coffee grounds for 10 per cent. of dry mash also resulted in a decline of 53 c.c. (King Wilson, 1942).

Whilst the moisture content of the foodstuffs, fed either as succulents or "dry," will largely decide the question of *drinking* or otherwise, it should be pointed out that young green leafy succulent plants are not only moister but more *digestible* than the mature plants, which could partly be explained by lignification of the fibre rendering it insoluble; but it has also been shown that when grass and clover of only five weeks' growth was cut in August and artificially dried its digestibility by rabbits was much reduced compared with succulents:—

		Per cent.		
Moisture.	*Foodstuff.*	*Digestibility Organic Matter.*	*Coefficients Fibre.*	*Fibre Content of Foodstuff.*
80	"Grass" fresh	63	49	22
9-10	„ artificially dried	49	26	21
14	„ hay	47	18	33
85	Lucerne, fresh	81	66	24
16	„ hay	61	39	28
85	Kale, fresh	83	55	11
11	„ dried	57	7	12

Since fibrous green foods are less digestible than when the plants are young and succulent (unless too laxative), it seems probable that experience led many breeders to rely extensively on this form of green fodder and may have given rise to the fallacy that rabbits do not drink. In dry weather the amount of moisture in wilted herbage rapidly declines, sometimes by as much as 30 per cent., but there is great variation. Fresh and dried fodder are not interchangeable merely by adjusting the dry matter, since replacement of fresh grass by hay (non-green colour) adversely affected fertility and viability, which additions of yeast, vitamins B_1, A or E failed to remedy. Combined supplements of cod-liver oil, wheat germ, yeast and ascorbic acid were also unsatisfactory (Nordfeldt, 1942) and it was concluded that the fresh grass contained a factor or factors essential for fertility and viability of the young.

Diets of green food only or succulents and hay *ad lib.* are suitable for maintenance but not for production (Page, 1942), but this may be dependent on their kind and quality, because although mangolds and hay, or cabbage, lawn trimmings and hay were inadequate rabbit breeders often claim to be successful with selected greenstuffs and hay, *e.g.*, fresh clover 1,590 g. and clover hay 300 g., increased by 100 per cent. when the young are about 50 days old. However, a supply of greenstuff alone is reputed to be unsuitable, as the moisture content is too high, therefore part of the bulky allowance should be fed dry. (It must also be remembered that clover is better digested than grass by rabbits.)

Some form of concentrates is generally necessary. When these consist of corn, bran, dry meal and bread crusts a good deal of water is drunk, although in war-time potatoes are a substitute and then the water requirement should be fully met, but when dry mash and greenstuff was given, without water, there were deaths from impaction of the caecum and the addition of water was beneficial to health and improved the growth rate (Christian, 1936; Rabbit and Vet. Depts., 1943). Rabbits deprived of water showed loss of appetite and there was a decline of 20 per cent. in fur growth (Wirth, 1933). Withholding water was observed

to cause urine drinking and was found to be a cause of cannibalism (King Wilson, 1941).

Similar results have also been observed with guinea-pigs.

Animals housed in the direct rays of the sun lose moisture from the body at a much higher rate, *viz.*, 12 to 23 c.c. per hour compared with 2 to 3 c.c. in the shade (Hill, 1920).

Summary

1. Water in some form is indispensable to the normal functioning of the body; its retention is closely connected with NaCl supply.

2. Whether or not a rabbit needs water as a "drink" depends on the moisture content of the ration. On a maintenance diet of succulents and hay none was found necessary, but when the "dry" foods were increased the drinking water requirements rose accordingly.

3. The water requirement is highest during lactation, varying with the size of breed and litter. Exposure of cages to the direct rays of the sun increases the requirements in hot weather.

4. Deprivation adversely affects the appetite; growth is thus retarded and ill-health and mortality are caused. Certain vicious habits can be prevented by the provision of a daily supply of *clean* drinking water.

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Bovine Hermaphrodite

Capt. D. BURGESS, R.A.V.C.

The following is a description of a bovine hermaphrodite, slaughtered by the Army at the Civil Abattoir, M.E.F., and reported by me on July 20th, 1943.

Description.—Light fawn colour, appeared to be maiden heifer—full mouth. Local breed of Syrian.

External Characteristics.—Strong horn and head, vulva enlarged, bulbs of clitoris and clitoris very much enlarged.

Rectal Examination.—This proved absence of ovaries and uterus; pelvic floor deep, but os pubes thickened. A solid round organ, about the size of an ordinary electric-light bulb, could be felt in the right lumbar region; a ligament attached to this organ was thought to be the broad ligament of a vestigial uterus. The animal micturated per vulva.

Post-mortem Examination

Uterus absent. The anterior end of vagina ended in a cul-de-sac. The bladder opened by a meatus on the floor of the vagina.

The Right Testicle.—Suspended by a ligament in the right lumbar region. It was normal, and as large as a medium-sized pear. A vas deferens led to a rudimentary penis.

The Left Testicle.—Not so well developed as the right—about the size of a duck egg, and embedded in the substance of the left mammary gland. Its vas deferens passed through the inguinal canal to rudimentary penis.

Rudimentary Penis.—This was mutilated in slaughter but the origin was from the ischiatic border.

Mammary Glands.—These were quite wel ldeveloped for a heifer.

Weekly Wisdom

The common people have the use of their limbs, for they live by their labour and skill. . . . They have eloquence to express their passions, and wit at will to express their contempt and provoke laughter. Their rational use of speech is not hung up in monumental mockery, in an obsolete language. . . . You will hear more good things on the outside of a stage-coach from London to Oxford than if you were to pass a twelvemonth with the undergraduates or heads of colleges, of that famous university.
—William Hazlitt, "On the Ignorance of the Learned."

ABSTRACTS

[**The Pathology of Equine Influenza.** Jones, T. C., and Maurer, F. D. (1943.) *Amer. J. vet. Res.* **4.** 15.]

A description of 150 autopsies on horses affected with natural and experimental influenza.

The condition is described as an acute infectious disease of the respiratory tract with frequent complications. At the height of a severe outbreak, it assumed the characteristics of a haemorrhagic pneumonia. The aetiology is complex. The disease is caused by a filtrable virus associated with streptococci. The lesions in the earliest stages of the disease are confined to the turbinates, the nasal mucosa, and the lymph glands of the upper respiratory tract. Erosion of epithelium, congestion and cellular infiltration of the nasal mucosa and submucosa are probably the earliest manifestations. They are followed by marked activity and proliferation of the mucous glands. The submaxillary and parapharyngeal lymph glands are initially oedematous and congested; later suppuration may occur. In the lung, the anterior and ventral parts are involved first. The initial lesions are located in the interstitial tissues and consist of oedema and fibrinous infiltration, which are followed by organisation and fibrosis. Consolidation of the lung tissue with haemorrhagic exudate follows the interstitial changes. The haemorrhagic exudate is later replaced by fibrinous and purulent exudates. When these exudates are not resorbed, organisation with intense round cell infiltration supervenes. Liquefaction and cavitation are common complications.

The lesions in other organs are secondary and vary with the duration of the disease and the occurrence of septicaemia. Abscesses in the kidney, myocardial degeneration and passive congestion of the liver are common. Purpura haemorrhagica is an important complication. It is characterised by oedema, haemorrhage and necrosis in the subcutaneous muscles, nasal mucosa and intestinal walls. Meningoencephalitis occasionally develops. It can be differentiated from equine encephalomyelitis by the intense purulent involvement of the meninges and purulent nature of the perivascular exudate.

[This is a valuable article with good plates, but unfortunately the authors do not discuss the differential diagnosis, and, until details of the experiments on the experimental reproduction of the disease are published, it is difficult to relate this work to earlier work in the same subject.]

J. F.

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[**The Swine Lungworm as a Reservoir and Intermediate Host for Swine Influenza Virus. III.—Factors Influencing Transmission of Virus and the Provocation of Influenza; IV.—The Demonstration of Masked Swine Influenza Virus in Lungworm Larvae, and Swine under Natural Conditions.** Shope, R. E. (1943.) *J. exp. Med.* **77.** 111-126 and 127-138. (13 refs.).]

III.—The author confirms and extends his previous observation that influenza may be present in non-infective form in the lungworms of pigs and be rendered active by suitable provocation. The method by which pigs, reared free of worms, are fed on earthworms containing infective lungworm larvae is described in detail. Influenza was produced in 130 of 216 swine prepared in this way. The most effective method of provoking the disease in prepared swine is by multiple intramuscular injections of *H. influenzae*; many other methods were tried, but the majority proved ineffective. In 15 instances prepared swine developed the disease spontaneously and for these indirect evidence suggests that their immune response to the lungworms themselves provided the necessary provocative stimulus. It was not found possible to provoke the disease in prepared swine during the summer months, while during the winter it was produced most easily in January, February and April. The author shows that lungworms are the source of the virus in prepared pigs since virus is only found in their neighbourhood shortly after provocation; also that lungworm larvae may remain infective for 32 months and that lungworm ova from recovered pigs contain masked virus. Mixtures of earthworms of several species were generally used to serve as intermediate hosts for virus infected lungworms, though two varieties of one species (*Allolobophora caliginosa*) were definitely shown to be capable of acting in this capacity.

IV.—Shope shows that when earthworms containing lungworm larvae from farms in which influenza appears annually in pigs, were fed to his experimental pigs, a proportion developed influenza following injections of *H. influenzae*. He further showed that two of three swine removed from such a farm during the interepizoötic period developed influenza after provocation. The author considers that evidence indicates that earthworms acting as intermediate host for infected lungworms explain the persistence of virus in the period between epizoötics and that the simultaneous appearance of numerous outbreaks over a wide area is due to the provocation

of influenza in pigs harbouring infected lungworms by a cause operating over the whole area. The occurrence of such outbreaks appears related to the onset of cold, wet weather in November and December. Herds infected at this time are immune to influenza during the immediately succeeding months in which the disease is easily provoked experimentally but seldom occurs naturally.

A. W. G.

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[**Value of Lawn Grass Cuttings in Feeding Bacon Pigs.** Woodman, H. E., and Evans, R. E. *J. agric. Sci.* **33**. 101-102.]

The claim by workers at Harper Adams College that 1¼ lb. of young, leafy grass can replace 1 lb. of balanced meal in the rations of fattening pigs was subjected to an extensive test. The experiment comprised four groups of weaned pigs all fed initially on balanced meal. In three of the groups the pigs were individually fed in proportion to their live weight, the fourth was fed as a group, the Lehmann system of feeding being adopted. One group was given 2½ lb. of meal per head per day and the appetite requirement above this was met by feeding freshly cut young grass at the level of 1¼ lb. of grass replacing 1 lb. of meal. The second group followed a similar plan except for a basal level of meal of 3 lb. per day. The third group acted as control being fed balanced meal up to appetite in proportion to body weight, whilst the fourth group received a daily allowance of 2½ lb. of meal with young grass fed *ad lib*. The grass employed was of high quality, averaging over 21 per cent. crude protein on a dry matter basis.

By the time the control group averaged 211 lb. (bacon weight) the other groups averaged 144, 156 and 157 lb. respectively, conclusively demonstrating the marked superiority of the all-meal diet over the groups receiving the grass-and-meal diet. Detailed analyses of the live weight gains over different periods of the experiment showed that at least 7 to 8 lb. of fresh grass were required to replace 1 lb. of meal and in certain periods well over 20 lb. of grass were fed for every pound of meal saved.

At the end of the grass feeding period the relevant groups were put on the all-meat diet when live weight gains immediately improved and actually exceeded those of the control pigs, showing that the normal growth impulse was not absent from these animals. The authors, whose results are in line with previous Cambridge experiments on the ability of young pigs to utilise young grass, are at variance with the claim of the Harper Adams workers that pigs can utilise young grass almost as efficiently as balanced meal for growth and fattening.

[Discrepancies in results of this nature are confusing, but a possible explanation may be looked for in the variation of the quality of the grass grown on different soils and under differing conditions of climate and season.]

A. E.

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[**Feline Enteritis.** Gochenour, W. S. (1943.) *N. Amer. Vet.* **24**. 104-108.]

Feline distemper is an acute contagious disease caused by a filtrable virus. It runs a rapid course and the mortality rate is high. The disease is characterised by a marked reduction in the leucocyte count, hence such synonyms as "infectious feline agranulocytosis" and "malignant panleukopoenia" which have been used by American authors. Intranuclear inclusions are found in the epithelial cells of the small intestine liver and kidneys. Artificial infection with virus is followed by a fall in the leucocyte count four to five days later; after contact exposure the incubation period before leukopoenia appears is seven to nine days. Half-grown kittens seem most susceptible to infection but the virus can be transmitted by either contact or inoculation to cats of any age. The virus has not been found pathogenic for any other species of animal.

The clinical symptoms are not diagnostic but a definite diagnosis can be made by making a leucocyte count: a total leucocyte count below 8,000 per cubic millimetre confirms the nature of the infection. The practitioner can usually recognise the leukopoenia by merely staining a blood film and noting the number of leucocytes in proportion to red blood cells, using a blood film from a healthy cat for comparison. The degree of leukopoenia is a reliable index of the severity of the disease; the presence of a high proportion of young neutrophil leucocytes ("shift to the left") suggests a more favourable prognosis.

In the United States protective inoculation is carried out, using either two doses of a formalised tissue vaccine or passive immunisation with hyperimmune serum. The latter is useful in animals which have been exposed to infection and should be followed seven to ten days later by active immunisation. Preliminary tests indicate that large doses of hyperimmune serum (15 to 20 c.c., repeated 12 to 24 hours later if required) may be a useful form of treatment in the early stage of the disease. The use of a variety of drugs, including various sulphonamides, has so far proved ineffective.

[For details of earlier work on this disease see abstract in *The Veterinary Record*, 1942, p. 76.] E. G. W.

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[**Mechanical Determination of the Juiciness of Meat.** Tannor, B., Clark, N. G., and Hankins, O. G. (1943.) *J. agric Res.* **66**. 403-412.]

A mechanical testing method to determine the tenderness of meat, in which use is made of a hydraulic laboratory press of standard make, equipped with electrically heated plates, and capable of producing up to 20,000 lb. pressure, is fully described by the authors. For testing meat the roast is allowed to remain at room temperature for 10 to 15 minutes after removal from the oven, and the muscle to be tested is dissected from the rest of the joint, cut perpendicular to the fibres in the middle, so that from each slice a cylindrical section is taken. Pressure is applied very slowly so that juice pours into a receiver, when pressure is released and the pressed meat cake removed from the cylinder. The loss in weight of the sample is taken as the weight of the expressed juice.

Adjacent samples, and samples from corresponding muscles of the two sides of the carcase, were found to be little different in expressible juice content. When samples having the same percentage of expressed juice were judged by a committee, beef was rated as most juicy, and pork the least. The mechanical method can be used with beef, mutton and pork, when variation in juiciness is due to production factors or to internal temperatures to which the meat is heated. It is a useful method as a supplement to, and later to replace, committee testing methods. D. J. A.

REVIEW

[**Banham's Veterinary Posology.** (Revised by W. J. Ironside.) pp.vii. 206. Price 12s. 6d. Baillière, Tindall & Cox, 8, Henrietta Street, W.C.2.]

This publication is the seventh edition of that well-known handbook of veterinary posology, and other information, the first edition of which was published in 1887. The present edition has been very ably revised; a great deal of deletion has been done and a considerable number of alterations have been made.

The section dealing with therapeutics, which has been revised by L. A. Auchterlonie, M.R.C.V.S., contains a very concise summary of the modern methods of treatment of various diseases.

The Dangerous Drugs Act as it affects the veterinary surgeon is capably dealt with in the chapter entitled "The Requirements of Legislation"; the table of the nomenclature of bacteriology of diseases caused by filtrable viruses, by F. Blakemore, M.R.C.V.S., D.V.S.M., is likely to prove of special value, particularly to older practitioners. Similarly the section dealing with the important parasites of the domestic animals and protozoan diseases and their transmitters has been very thoroughly revised, and greatly improved by Dr. E. L. Taylor.

Other information, varying from a table on the composition and nutritive value of feeding-stuffs to a description of mange parasites, is still included in its pages, and it may be said that in its present form "Banham's Posology" is likely to prove an indispensable handbook of reference for veterinary students and practitioners alike.

ROYAL VETERINARY COLLEGE AND HOSPITAL

Appointments to Professorships

As we go to press we are informed that at a meeting of the Council of the Governors of the Royal Veterinary College and Hospital, which was held on November 12th, 1943, the following appointments were made:—

Professor of Veterinary Medicine—Mr. H. Burrow, M.R.C.V.S., D.V.S.M., F.R.SAN.I.

Professor of Veterinary Surgery—Mr. C. Formston, M.R.C.V.S.

Professor of Veterinary Physiology—Dr. O. G. Edholm, B.SC., M.R.C.S., L.R.C.P., M.B., B.S.

Professor Formston has taken up his appointment and Professors Burrow and Edholm will take up their appointments before the beginning of the 1944-45 session.

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Lord Mildmay of Flete has been re-elected President of the Royal Agricultural Society of England for 1944.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Dec. 1st.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 2.30 p.m.
Dec. 1st.—Special Meeting of the Scottish Branch, N.V.M.A., at Glasgow, 2.30 p.m.
Dec. 2nd.—Annual General Meeting of the North Wales Division, N.V.M.A., at Rhyl, 2 p.m.
Dec. 2nd, 3rd.—R.C.V.S. Written Examination.
Dec. 6th.—Oral Examinations begin in Dublin.
Dec. 6th.—All changes of address for the Register of Veterinary Surgeons to be indicated to the Registrar at 10, Red Lion Square, W.C.1.
Dec. 10th.—Meeting of the South Wales Division, N.V.M.A., at Swansea.
Dec. 15th.—Meeting of the Section of Comparative Medicine, Royal Society of Medicine, 1, Wimpole Street, W.1, 2 p.m.
Dec. 16th.—N.V.M.A. Committee Meetings.
Dec. 17th.—**Meeting of Council, N.V.M.A.**, in London.
Jan. 5th, 1944.—R.C.V.S. Committee Meetings.
Jan. 6th.—**R.C.V.S. Council Meeting.**

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N.V.M.A. Council and Committee Meetings

The next meeting of Council, N.V.M.A., will be held in London on Friday, December 17th, with Committee meetings the day before.

Members of Council who intend to be present at these meetings are advised to make early application to hotels should they wish to reserve accommodation.

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PERSONAL

PROFESSOR WOOLDRIDGE HONOURED

Emeritus Professorship of Veterinary Medicine at the Royal Veterinary College and Hospital

The profession, unitedly associating itself with the tribute, will learn with gratification of the two resolutions following, which were passed by the Council of the Royal Veterinary College at a meeting held on November 12th, 1943, regarding the retirement of Professor George H. Wooldridge, F.R.C.V.S., M.R.I.A.:—

1. On the occasion of Professor Wooldridge's retirement the Council desires to put on permanent record its very high appreciation of his work during the past 35 years at the Royal Veterinary College and especially at the College Hospital. Throughout that time he has taught and encouraged successive years of students and has endeared himself to all with whom he has been in contact, he has made valuable contributions to the development of veterinary medicine and he has given his services without stint to the alleviation of animal suffering.

2. As a mark of its high esteem for Professor Wooldridge, the Council invites him to accept the Emeritus Professorship of Veterinary Medicine at the Royal Veterinary College and Hospital.

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Forthcoming Marriage.—Griffiths—Hardie.—The engagement was announced in April, 1943, between Lieut. Reginald Bark Griffiths, R.A.V.C., younger son of Mr. and Mrs. W. Griffiths, of Mossley Hill, Liverpool, and Celia, second daughter of Mr. and Mrs. J. S. Hardie, of Wavertree, Liverpool.

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Mr. S. E. Sampson Bereaved.—We regret to learn that the death of Mrs. Blanche Sampson, wife of Mr. S. E. Sampson, M.R.C.V.S., of 42, Clarence Road, Hillsborough, took place on October 29th. Mrs. Sampson possessed a charming personality and as the wife of the district veterinary surgeon she became intimately known to the farmers over a wide area, winning the esteem of all. The members of the North Midland Division, N.V.M.A., extend their deep sympathy to Mr. Sampson and the two sons and three daughters thus bereaved.

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Mr. Alastair N. Worden, B.A., B.Sc., M.R.C.V.S., has been elected an Associate (A.I.C.) of the Royal Institute of Chemistry.

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R.C.V.S. OBITUARY

Anthony, William Samuel, C.B., C.M.G., Major-General A.V.S. (retd.), Colonel Commandant R.A.V.C. Graduated London, May 15th, 1895. Died November 15th, 1943.

Major-General W. S. Anthony, C.B., C.M.G., M.R.C.V.S.

We announce above with great regret the death of Major-General W. S. Anthony, Colonel Commandant of Royal Army Veterinary Corps since 1934, who was Director-General Army Veterinary Services 1929-1933. On behalf of the profession, we join with Major-General Anthony's colleagues in the R.A.V.C. in extending deepest sympathy to the widow, son and daughter in their loss. A memoir will appear in an early issue.

Beddard, William Henry, Rhyader, Richmond Road, Wolverhampton. Graduated London, December 20th, 1895. Died November 11th, 1943.

Mr. Beddard, who died suddenly on November 11th, had practised for very many years in Wolverhampton. He was a member of the Albrighton Hunt and a director of the Midland Greyhound Racing Co., Ltd.

Among those present at the funeral at St. Philip's Church were Major F. Chambers, M.R.C.V.S., Captain J. Robertson, M.R.C.V.S., and Mr. R. O. W. Walpole, M.R.C.V.S., who represented the Midland Greyhound Racing Co.

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The Late Mr. Geoffrey T. Matthews

Late Superintending Inspector, Ministry of Agriculture

In the passing of Mr. Matthews on Saturday, November 13th, at the early age of 57, recorded in our last issue, the veterinary profession has lost one of its most able and enthusiastic members. His death will be mourned by a wide circle of friends and particularly by his colleagues on the veterinary staff of the Ministry of Agriculture.

Graduating in London in December, 1906, Mr. Matthews joined the staff of the Ministry in 1908. For many years he was stationed at Norwich and it is probable that he was best known in East Anglia, where his activities as a member of the Eastern Counties Veterinary Medical Association are still fresh in the memory of his many friends in that area. Mr. Matthews was elected President of the Society in 1932 and his close association with that body was only severed by his passing.

In 1925 he was promoted to the rank of Superintending Inspector and two years later moved to Bedford. In 1934 he was transferred to the Ministry's Head Office, where he remained until his death.

For many years Mr. Matthews served on the Committee of the Association of Veterinary Inspectors and represented that Society on the Council of the N.V.M.A.

His keen interest in the Victoria Veterinary Benevolent Fund was well known and his last request, that instead of floral tributes at his funeral donations might be given to that fund, shows that the fund has lost one of its most ardent supporters.

To his widow, daughter and son we offer sincere sympathy in their great loss.

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New Zealand Appointments.—In connection with the announcement made in our advertisement columns inviting applications from Veterinary Officers to fill vacancies in Government and other Services in New Zealand, it is hoped that intending applicants will take advantage of the opportunity intimated therein to obtain full particulars of conditions (exchange rate, pension provision, etc.) as they compare with those in this country.

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RENEWAL OF STATE GRANTS TO GLASGOW VETERINARY COLLEGE

The Chairman of Governors of Glasgow Veterinary College (Mr. Alexander Murdoch, C.A.) announced at last week's prize-giving ceremony that Government grants to the College which were withdrawn in 1925 by the then Secretary of State for Scotland (the late Sir John Gilmour) have now been renewed during the regime of Mr. Thomas Johnston.

The intimation by the Chairman of the College was made in the form of a letter received from the Department of Agriculture which stated that the Chairman of the Veterinary Education Committee appointed by the Government had had meetings with the College Governors and with representatives of Glasgow University regarding the future of veterinary education in Glasgow. A scheme was discussed " which may result ultimately in the University becoming responsible for the teaching of the whole veterinary course in Glasgow."

As some time will elapse before such a scheme can come into operation, the Committee recognise that the Glasgow College must carry on the work meantime. It would not be possible for it to do so on its present resources after the close of the College financial year at July 31st next. " In the circumstances," stated the letter, " the Committee have recommended that a grant not exceeding £5,000 should be made from State funds to the College in the financial year 1944-45 in respect of the anticipated deficit in the

College accounts between August 1st, 1944, and March 31st, 1945, subject to examination and approval of a detailed estimate of maintenance expenditure and income to be submitted by the College to this Department."

The Chairman expressed the Governors' satisfaction with this arrangement.

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ROYAL ARMY VETERINARY CORPS

Colonel (Hon. Brigadier) Mosley, Colonel Commandant

By a sad coincidence, simultaneously with the news of General Anthony's death, recorded above, official announcement was made of the appointment of his successor as Colonel Commandant of the Royal Army Veterinary Corps, tenure of which post he would have completed on January 3rd, 1944. The new Colonel Commandant is Colonel (Hon. Brigadier) H. S. Mosley, D.S.O., who was formerly Director of Army Veterinary Services in India.

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The following announcement is made in the issue of *The London Gazette* dated November 12th, 1943: To be Lts.: Kenneth Evans Scott (294071), September 20th, 1943; David William Caldwell (294627), September 27th, 1943; William Lang (294624), September 30th, 1943.

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LEGAL NOTES

False Pretences in the Sale of Stock

Sentence of nine months' imprisonment in the second division was passed by Mr. Justice Singleton at Hereford Assizes, on Ellis Williams Dale, aged 30 years, a farmer, of Canwood, Woolhope, Hereford, on charges of false pretences, arising out of a sale of attested and other cattle at Frome Manor, Bishops Frome, on March 19th. It was alleged that payment was secured (from various purchasers) with intent to defraud, and the Judge, passing the sentence intimated, ordered Dale to pay the costs of the prosecution, not exceeding the sum of £250.

Outlining the prosecution's case, Mr. Cartwright Sharp said the charges on which they were proceeding were all of the same class—of having obtained money by the false pretence that heifers or calves were sired by well-known bulls whereas they had not that exalted origin. When the accused's father parted with Frome Manor he also desired to get rid of a valuable dairy herd, which had been superintended for many years by the accused. Details of the cattle sold, with other stock, were given to the auctioneers by the accused. It was obvious that in purchasing stock one of the things that a farmer or breeder looked for was the pedigree of any particular animal he was going to buy, and any auctioneer, if he could say that a heifer or calf had been sired by a very well-known animal, would certainly record that as a "bull point," which would increase the amount he could expect to receive for that animal.

Turning to the catalogue, Mr. Cartwright Sharp, after mentioning entries which, he said, were perfectly true, drew the attention of the Judge to entries of attested Friesian cattle stated to have been sired by Hales Bargent, a well-known and valuable bull. Not a single one of them had any relationship whatsoever with that bull: they were animals sired by some unknown bull, and bought in the markets. It was pretended that other animals in the catalogue, and subject to the charges, were sired by Lypgate Leopold, a bull belonging to the Dales, but in fact these animals had no relationship with that bull, some of them having been purchased in Hereford Market on July 29th. The accused, who managed the cattle, and made returns to the Ministry of Agriculture, must have known that it was a deliberate lie to say that these animals were sired by the two bulls. The total amount obtained for the lots which were the subject of the charges was £333.

In sentencing the accused, the Judge said that anyone who had anything to do with a herd of dairy cattle knew the importance attached by everyone to records. He had lately bought some of these heifers and wrongly stated their pedigree.

Defendant had been committed for trial from a special police court at Bromyard, on which occasion Mr. A. Gordon Clark, for the Director of Public Prosecutions, said that the herd, apart from other cows and heifers, was described as an attested herd. There was a provision in the certificate that three fields should be excluded from the rest of the farm, so that animals excluded from the attested herd might be kept on those three fields.

The first point they complained about was that beasts which had failed to pass the test were not confined to those three fields, but before the sale were allowed to mingle with the others.

The second misrepresentation which they alleged was in the catalogue in regard to the breeding of the animals. A large number of heifer calves was sold; in some cases they were given the name of the dam, and in a great many places they were given the name of the sires. Two bulls were involved in the case. One, in the possession of the defendant or his father, was Lypgate Leopold, and they knew the date he came into their possession. It would be possible to prove that a number of the calves could not conceivably have been sired by this bull. They could go further and prove that Dale or his father had been for a year preceding the sale, and almost right up to the date of the sale, buying a large number of calves in Hereford Market. Of the breeding of the Friesian heifer calves he knew nothing, none the less he represented them to intending purchasers as having been sired by Lypgate Leopold or by Hales Bargent. The Dales had seen Hales Bargent and proposed to buy it, but they changed their minds and called the deal off. Hales Bargent was never in their possession, and had never served any of the cows in their possession.

Drawing attention to the milk yields given in the catalogue, Mr. Clark said he should call evidence that a scales for weighing milk was never seen on the farm until just before the sale, and he would call employees who would say that they had never known the milk to be weighed. As a result, the information purchasers relied up was perfectly fictitious.

Veterinary Surgeons' Evidence

Mr. John R. Barker, M.R.C.V.S., Hereford, gave evidence to the effect that attested cattle would realise higher prices than non-attested animals, or attested animals which had been allowed to mix with non-attested ones. It would be a very inaccurate method of determining the milk yield by weighing the milk on one day and multiplying the weight by the number of days a cow was in milk.

Mr. W. Fredk. McConnell, M.R.C.V.S., Ledbury, who had carried out several tests of the cattle at Frome Manor, put in certificates, showing the results of the tests. He tested a heifer which was subsequently purchased; it was a reactor. He tested all the animals in the buildings at Frome Manor; he was not aware there were any others there. All he tested were identified by ear-marks.

Dr. Arthur J. Wilsdon, M.R.C.V.S., Hereford, Divisional Inspector of the Animal Health Division of the Ministry of Agriculture and Fisheries, said, in the course of his evidence, that he compared a list which he received from defendant with the catalogue on the sale day, and noticed that lots 52 to 74 in the catalogue were missing from the list, and that these animals had no ear-mark numbers. Defendant told him they were untested cattle, and were kept on another farm. He pointed out to defendant that they should not have been at the sale. There was only one of the fields under grass, and there was no building on it. It would be absolutely impossible for 23 cattle to exist on that field. Defendant told him at first that he did not take milk from these cows, but that he suckled calves on them. Asked if he suckled calves on them how they had got milk records, he replied that he did not suckle the calves on them on one day, and he weighed the milk and that he calculated the yield by the number of days he thought the cows were in milk. Defendant later said he milked some of the cows, and he placed his initials against the numbers of these cows in the catalogue. He said these cows had been running with the rest of the herd.

Witness went into detail in comparing returns made to the Ministry by the defendant and entries in the catalogue, and pointed out several alleged discrepancies in the catalogue. In the case of one cow (ear-mark 10), he said it was highly improbable that she gave birth to a calf on the date stated unless she aborted a seven months' calf. "This is the sort of cow most farmers would like to have. It's a feat of nature, not impossible but highly improbable," said witness.

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THE NATURE AND CURE OF GOITRE

In this country goitre does not attract the attention of the veterinary practitioner to the same extent as it does that of the human physician. It is otherwise in some other countries. Thus an American text-book on the *Diseases of Small Domestic Animals*, by O. V. Brumley (1931, Baillière, Tindall and Cox), gives special prominence to the forms of goitre which are observed in the United States. There goitre (struma, bronchocele) is very frequent in dogs, and is sometimes congenital, whole litters of puppies becoming affected, and the enlargement of the glands in these cases may be so great as to interfere seriously with parturition; the glands, which may increase to six to ten times the normal size, may be as large as the puppy itself. The forms described are (*a*) parenchymatous, which is by far the most common in puppies and young dogs; (*b*) cystic; (*c*) fibrous, which is frequent in old animals; (*d*) vascular; (*e*) malignant; (*f*) exophthalmic, characterised by exophthalmia, functional disturbances of the circulatory system and more or less enlargement of the thyroid—this form is not of frequent occurrence in animals, but it is found occasionally in the dog. Some striking outbreaks of endemic goitre among

farm animals in the North-Western States of America are also referred to by Cameron in his *Recent Advances in Endocrinology* (1935, Churchill). These outbreaks yielded dramatically to iodine treatment. Similar outbreaks have recently also been described in South Africa by Quinlan and have long been recorded in various parts of Europe. Goitre which is accompanied by deficient thyroid secretion (hypothyroidism) is clinically usually not serious in animals, although in the State of Montana between a hundred thousand and a million young pigs have been reported to die each year from compression of the trachea. Goitre which is accompanied by increased thyroid secretion (toxic goitre) is a far more disturbing condition and is unhappily common in the human subject, especially among females. In the domestic animals, however, so far as is recorded, it is somewhat rare, though this or a similar condition had been occasionally observed in horses, cattle, dogs and sheep (Hutyra, Marek and Manninger, *Special Pathology and Therapeutics of the Domestic Animals*, 4th English edition, 1938, p. 250).

Within the last few years much light has been thrown upon thyroid function and research has now resulted in the discovery of therapeutic measures of such striking importance that a brief outline is here presented to the veterinary reader. The progress made is related below as given in two recent leading articles in the *Lancet* (August 14th, p. 197, and October 16th, p. 483) and in Professor Himsworth's article in the latter issue of the same journal.

The classical work of Marine (1935) showed that hyperplasia of the thyroid gland (goitre) does not necessarily indicate thyrotoxicosis (Graves' or Basedow's disease, exophthalmic goitre), the well-known symptoms of which are caused by excessive secretion of thyroid hormone into the system. Hyperplasia and lack of colloid should be interpreted, in the normal animal at least, as meaning that the thyroid gland is producing insufficient of the thyroid hormone for the needs of the body and is being stimulated to hyperplasia to remedy the deficiency. Such hyperplastic glands, Marine showed, occur in animals on an iodine-deficient diet and their histological picture reverted towards normal when iodine was given. On the deficient diet it seemed that the tissues suffered from lack of the iodine-containing hormone. Normally, such a state is corrected through the agency of the thyrotropic hormone of the anterior pituitary which stimulates the thyroid gland to become hyperplastic and more active. Even a hyperplastic thyroid, however, cannot manufacture the thyroid hormone without iodine and so the stimulus continues and the hyperplasia is intensified. When under such conditions iodine is given and the thyroid hormone is produced in quantity, the stimulus to hyperplasia abates and the gland reverts to its "resting" state. Thus is explained the simultaneous occurrence of a clinical state of hypothyroidism and hyperplastic thyroid gland.

Recently (Carter *et al.*, 1943) it has been announced that certain substances may occur naturally within the body which are capable of inhibiting the action of the thyroid hormone (thyroxine). Thus paraxanthine, which occurs in ox blood in a concentration of 0·2 to 0·6 μg per c.c., has been found to inhibit, in a dose of 0·22 μg, the effects of 1 mg. of thyroxine on the frog's heart.

Several substances found outside the body were already known to have a similar anti-thyroid effect. Thus the leaves of cabbage and other brassicae have a goitrogenic effect in rabbits (Chesney *et al.*, 1928; Spence *et al.*, 1933), and the same effect can be produced in rabbits by feeding brassica seeds (Hercus and Purves, 1936; Kennedy and Purves, 1941) and soya beans (Sharples, 1938). The changes in the thyroid have been described as a diffuse parenchymatous goitre (Webster and Chesney, 1930) involving increase in size with loss of colloid. Remarkable changes in thyroid weight over long periods, from an average of 0·18 g. to one of 19·5 g. were recorded in rabbits. Simultaneous changes were recorded in the anterior pituitary gland (Griesbach, 1941). The changes did not take place in the absence of the pituitary gland (Griesbach *et al.*, 1941), suggesting that the thyroid changes were secondary to disturbance of the pituitary thyrotropic function. Attempts to isolate the causative substance present in rape seed (Kennedy, 1942) suggested that it might be a derivative of thiourea, and it was found that allyl-thiourea in a daily dose of 20 mg. caused the typical size and histological changes in the rat thyroid, as well as the associated and probably primary changes in the pituitary.

Shortly before the above observations were recorded by Kennedy and his colleagues in New Zealand, the attention of two groups of American workers was drawn to a similar action produced on the thyroid in testing the effects of certain sulphonamide drugs. J. B. and C. G. Mackenzie and McCollum (1941) were studying the effect of sulphaguanidine as an intestinal disinfectant and came to investigate its toxicity to the rat. They noted that animals dying after sulphaguanidine showed goitres and that on section the thyroid tissue showed hyperplasia and loss of colloid. Richter and Clisby (1941, 1942) confirmed this observation and further showed that other sulphur compounds, notably thiourea and thiouracil, had a well marked goitrogenic effect. Quite recently, Astwood (1943) has recorded the results of an extensive research on the relative effect of 106 chemical compounds. In each case the substance was administered in the food or drinking water for a period of ten days, and the degree of thyroid hyperplasia estimated. Anti-thyroid activity was shown by two classes of substances—thiourea derivatives and certain aniline derivatives. Of the former the following were more active than thiourea, in decreasing order of activity: 2-thiouracil, 2-thiobarbituric acid, *sym*-diethylthiourea, and 5-benzol-2-thiohydantoin. The effective aniline derivatives included the sulphonamides, *p*-, *m*-, *o*-aminobenzoic acids, *p*-aminophenyl acetic acid and *p*-aminoacetanilide. Thiocyanates were found to cause thyroid enlargement only in the absence of added iodine, while organic cyanides were ineffective.

Striking results have now been recorded in the application of the above knowledge to the treatment of human cases of thyrotoxicosis. These attempts were first made by the American worker, Astwood (1943). According to him, thiourea in doses of 1 to 2 g. daily, or thiouracil in doses of 0·2 to 1 g. daily, caused, in the space of a few weeks, the disappearance of the thyrotoxic symptoms to such an extent that the patient could resume his normal activities and remain in good health as long as the drug was continued. After the administration of the drug there was a latent period of one to two weeks before the pulse began to fall. Thereafter it fell steadily towards normal and coincidentally the weight increased, symptoms of thyrotoxicosis abated, the basal metabolic rate fell, and the blood cholesterol rose. As long as the drug was continued this improvement persisted, but on omission of the drug the signs of thyrotoxicosis returned only to disappear again on the resumption of treatment. No serious complication has been reported to follow treatment, though Williams and Bissell (1943) observed slight transient swelling of the legs (*i.e.*, slight myxoedema) in two of their nine cases, in association with a slight increase of the serum chloride and a decrease of the carbon-dioxide combining process of the blood. Furthermore, the simultaneous administration of thiouracil did not prevent the increase in the basal metabolic rate caused by the administration of desiccated thyroid to myxoedematous subjects.

Astwood's claims have now been fully confirmed in a paper just published by Professor Himsworth, of University College Hospital, London (*Lancet*, 1943, October 16th, p. 465). Dramatic recovery was seen to occur in a very severe case, and in five milder cases the results were similar, though less dramatic. The evidence suggested that thiourea acts by interfering with the synthesis of thyroid hormone.

J. T. E.

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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NICOTINE POISONING IN CATTLE

Sir,—The accounts of nicotine poisoning published in *The Veterinary Record* of June 12th were of particular interest to me because, some years ago, I had a somewhat similar experience.

A sample of locally made tobacco extract was sent to be tested with regard to its efficiency as a tick grease. The instructions were to mix one part of the extract with ten parts of motor oil and to apply it as a tick grease. Owing to pressure of work in the control of rinderpest it was not possible to carry out the test until some two months later.

When the test was started, the farm manager, owing to a misunderstanding, treated the cattle over the entire body with the undiluted extract. By the time the fifth was being dressed the first one had developed most alarming symptoms. The animals were promptly washed, but even before this had been finished the first and second were dead. The farm manager came hastily to summon me from seven miles away at the same time taking a carload of natives who had handled the extract to hospital. These natives complained of pains in their arms and, in some cases, of dizziness; they all recovered in the space of a few hours without treatment.

On my arrival at the farm I treated the remaining three cattle with strychnine and they made a rapid recovery.

In investigating the matter I discovered that the extract had not been diluted, but I could not believe that a dilution of 1 in 11 could be safe with an extract of such obvious toxicity. I took some of the extract, diluted it carefully according to the instructions, and dressed an old and useless animal. The animal died within 20 minutes. Later, as a demonstration to some other officers, I treated another animal with the diluted extract, dressing only the parts upon which ticks are most commonly found, *viz.*, the

ears, under the jaw, the dewlap, armpits, belly, udder and the perineal area. This animal died in 45 minutes.

The symptoms noted, in order, as far as I can remember, were champing of the jaws, salivation, marked contraction of the pupils, jerky movements, inco-ordination, falling and coma. There were no perforations of the skin and a negligible tick infestation. The animals certainly did not lick themselves and treatment was carried out in the morning, the coolest period of the day. There seemed no possible route of the poisoning other than absorption through the unbroken skin.

Both the farm manager and I felt slight pains in our arms and particularly on the inner aspect of the elbow, an area which did not come into contact with the dressing.

Yours faithfully,

The Veterinary Department, R. B. H. Murray.
Lira, Uganda.
September 2nd, 1943.

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TREATMENT OF ACTINOBACILLOSIS

Sir,—I was interested to read some of Mr. Pierse's experiences in the treatment of the above condition by the intravenous injection of sodii iodide, and had myself reached substantially the same conclusions: that many cases result in a spectacular and immediate improvement following the injection, but that in a large proportion this is not maintained.

Case No. 2 in Mr. Pierse's series is typical of the results I have obtained, and I now adopt the following procedure: an initial injection of sodii iodide (1 to 1½ oz.) is given when the case is first visited, followed by pot. iod. gr. xx, hyd. biniod. rub. gr. x, night and morning, commencing on the third or fourth day after injection and continuing until complete recovery has taken place. I find that by this method any improvement following the injection is more likely to be maintained, and I also consider it important to continue drenching for a few days after the animal appears to be cured.

Yours faithfully,

Bolton. J. Adamson, jun.
November 15th, 1943.

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"BOTH TESTES ABDOMINAL: A SIRING QUERY"

Sir,—In reply to Mr. C. S. Hopkins's letter in this week's *Record* regarding cryptorchids, I have had 50 years' experience in castration of cryptorchids, but have never heard of one getting any foals. Two cases I had were valuable shire colts with both testes intra-abdominal. The owners had many mares served by them, but with no results. One of them, I found when operating, had both testicles cystic but the other had normal glands.

Yours faithfully,

Abbottsford, H. A. Barrett.
Nuneaton.
November 14th, 1943.

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VETERINARY SURGEONS ACTS (AMENDMENT) BILL

Sir,—Two items in your issue of November 13th, namely "Weekly Wisdom" and the letter from "Private, R.A.V.C.," have persuaded me to add to the correspondence on this controversial subject.

As I see it there is a proposal to make the veterinary profession a "closed shop," with the following objects in order of importance:

(*a*) To safeguard and improve the lot of the animal population.
(*b*) To improve the status of the profession.
(*c*) To safeguard and improve the lot of individual practitioners.

If we wish to close the shop the following points must be borne in mind:—

1. It is perfectly legal for anyone to practise medicine and surgery on animals provided they adhere to the law as laid down in the various Animal Anaesthetic Acts, D.D.A., Poisons Regulations, etc., etc.

2. It is not legal for an unregistered practitioner to use the title "veterinary surgeon."

3. The public, as represented by Parliament, would never agree to any individual's livelihood being removed by a general regulation.

4. Obviously some standard must be laid down as to the length of time that an individual may practise before he is fairly entitled to call such work his livelihood.

5. As the case for inclusion of unregistered practitioners turns on the question of livelihood and not on mental ability, it is doubtful if Parliament would agree to any condition such as an examination being imposed.

6. There is a precedent for the proposed Bill, namely the Regulations regarding Dental Practice, on which it is obviously founded and upon which it has some improvements.

While I consider that some of the details of the draft Bill are vague and that the structure of it could, with benefit, be further discussed, I am in agreement with the general principles, and for the following reasons:—

1. Advertising as a help to practice will be abolished.
2. All practitioners will come under professional discipline.
3. Professional discipline will have greatly increased power, and all practitioners will, therefore, have to maintain a high standard of conduct and practice.
4. As a result of 1, 2 and 3 the true charlatan will soon go out of business no matter how long he has been in it.
5. All forms of unqualified practice will eventually die out.
6. As a result of these events the lot of the animal population will be improved and safeguarded, which brings us back to the beginning.

I realise that by this time I am probably paying tribute to a corpse. I hope not, but if such is the case at least I have fulfilled the old dictum "*De mortuis nil nisi bonum*"!

Yours faithfully,

22, Woking Road,
Basingstoke.
November 14th, 1943.

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V.V.B.F. CHRISTMAS GIFT FUND

Sir,—Once again may we appeal to your generous readers to contribute to the Fund for Christmas gifts to the deserving widows and orphans whose distress we are relieving by small weekly grants? We hope to be able to send postal orders for £1 or £2 to each of them to enable them to buy something, a little extra food or some necessary article of clothing for the winter.

Donations, which will be thankfully acknowledged, should be sent to Fred Bullock, the Secretary of the Fund, at 10, Red Lion Square, London, W.C.1. All contributions received before December 20th will be used for this year's gifts. Cheques received after that date will be credited to next year's fund.

J. W. Brittlebank, *President*.
P. J. Simpson, *Hon. Secretary*.
A. Spicer, *Hon. Treasurer*.

Victoria Veterinary Benevolent Fund,
10, Red Lion Square,
London, W.C.1.
November 16th, 1943.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Parasitic Mange*	Sheep Scab	Swine Fever
Oct. 16th to 31st, 1943 ...	13	—	—	49	27
Corresponding period in—					
1942 ...	30	21	—	30	27
1941 ...	11	—	1	6	12
1940 ...	31	2	—	11	268
Total Jan. 1st to Oct. 31, 1943	244	15	6	175	447
Corresponding period in—					
1942 ...	292	552	26	168	400
1941 ...	354	259	17	160	996
1940 ...	470	35	15	141	4,211

Note.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.*, herds officially certified as free from Tuberculosis as at October 31st, 1943, was as follows:—

England	Wales	Scotland	Total (Great Britain)
3,952	8,689	3,506	16,147